

REMARKS

Claims 1-4, 12-17, and 25-28 are pending in the present application. The Examiner rejected claims 1-4, 12-17, and 25-28 under 35 U.S.C. §103(a). Applicant has amended claims 1, 13, 15, and 26, canceled claims 12 and 25. No new matter was introduced.

Section 103 Rejections

Claims 1-4, 12-17, and 25-28 were rejected under 35 U.S.C. §103(a) as being obvious over Kim, *et al.*, “Relationship of MRI Delayed Contrast Enhancement to Irreversible Injury, Infarct Age, and Contractile Function”, AHA Basic Science Reports, Nov. 9, 1999, in view of U.S. Patent Publication No. 2004/0064064 (Zhou, *et al.*).

Kim is directed to the examination of delayed contrast enhancement and wall motion after severe but reversible ischemic injury, acute infarction with and without reperfusion, and chronic infarction in chronically instrumented dogs. Kim discloses acquiring contrast enhanced MR images from dogs that had been instrumented, acquiring *ex vivo* contrast enhanced MR images of hearts removed from euthanized dogs, measuring wall thickening using a commercial software package, and measuring image intensities in contrast enhanced images. An independent observer analyzed tissue samples extracted from canine hearts. Except for the use of the commercial software to determine wall thickness, which was cited by the Examiner as disclosing *segmenting an endocardial border and epicardial border of the section of the myocardium; dividing the segment of the section of the myocardium into sectors*, Kim does not disclose the use of a computer to identify viable and non-viable tissue in the myocardium.

The Examiner cited Kim as disclosing measuring one or more features of the myocardium, however, Kim only discloses measuring the image intensity, not a plurality of features, as recited in amended claims 1 and 15. Kim also discloses an observer determining the viability of myocardial tissue by comparing image intensities to a predetermined threshold. However, Applicant urges that having an observer determine tissue viability does not teach or suggest *applying the measured plurality of features to a*

decision function to create a decision surface and determining from said decision surface whether each sector contains viable or non-viable myocardial tissue, where these steps are performed by a computer processor.

The Examiner cited Zhou as disclosing the use of a support vector machine. Zhou is directed to the *in vivo* detection of the effects of Alzheimer's disease in the interior of an eye using an optical analysis signal representing the birefringence of the retinal nerve fiber layer structures of the eye (see paragraph [0017]). Paragraph [0014], cited by the Examiner, does discuss support vector machines, but states that these tools were not used to evaluate the effects of Alzheimer's disease on the retinal nerve fiber layer of the eye. Rather, Zhou discloses the use of artificial neural networks (ANN) to perform this evaluation. Applicant urges that using an ANN to evaluate the effects of Alzheimer's disease on the retinal nerve fiber layer of the eye does not teach or suggest using a decision function to analyze measurements from a myocardial sector to determine whether that sector is viable or non-viable. Thus, Applicant urges that Zhou fails to rectify the deficiencies of Kim, discussed above.

The Examiner responded by stating that “broadly providing a mechanical or automatic means to replace manual activity which has accomplished the same result involves only routing [sic] skill in the art (see *In re Venner*, 120 USPQ 192).”

Applicant respectfully disagrees with the Examiner, and urges that the Examiner's reliance on *In re Venner* is misplaced. In *Venner*, all the claim limitations were disclosed in the applied references. In a recent appeal decided by the BPAI, *Ex parte Wollenhaupt*, Appeal 2007-3142 (BPAI 2008), the BPAI held that when the prior art references fail to teach or suggest all claim limitations, the Examiner cannot rely on *Venner* as a *per se* rule of obviousness. In the present case, unlike in *Venner*, the Examiner has not provided a combination of references which discloses a decision function that maps a multidimensional vector x formed of said selected feature measurements to a scalar real value indicative of whether a tissue sector is viable or non-viable, as recited in amended claims 1 and 15. The Examiner has only cited Kim's disclosure of an observer comparing image intensities to a predetermined threshold to determine the viability of

myocardial tissue, and Zhou's use of an ANN to evaluate the effects of Alzheimer's disease on the retinal nerve fiber layer of the eye. Neither of these references, either singly or in combination, teaches or suggests a decision function that maps a multidimensional vector x formed of said selected feature measurements to a scalar real value indicative of whether a tissue sector is viable or non-viable. In addition, the Examiner's rationale supporting the conclusion of obviousness was based on an application of the holding in *Venner* as a *per se* rule of obviousness. Applicant urges, however, that for the reasons set forth above, such an application of *Venner* is erroneous. Because the Examiner has not cited a combination of prior art references which disclose a decision function that maps a multidimensional vector x formed of said selected feature measurements to a scalar real value indicative of whether a tissue sector is viable or non-viable, and because the Examiner's stated motivation to modify the prior art references was incorrectly based on *Venner*, Applicant urges that the Examiner has failed to set forth a *prima facie* case of obviousness of claims 1 and 15 over Kim and Zhou. Reconsideration and withdrawal of these rejections are respectfully requested.

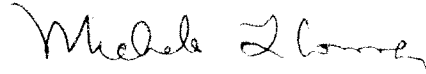
Claims 2-4, 13-14, 16-17, and 26-28 all depend from either claim 1 or claim 15, and are patentable for at least the same reasons as claims 1 and 15. Reconsideration and withdrawal of these rejections are respectfully requested.

CONCLUSION

Applicant urges that amended claims 1-4, 13-17, and 26-28 are in condition for allowance for at least the reasons stated. Early and favorable action on this case is respectfully requested.

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Respectfully submitted,



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